REMARKS

Claims 1-3, 17-19 and 23-25 are currently pending in the present application. The title appearing on page 1 and on page 40 of the specification is being amended herein. Independent claims 1, 17 and 23 are also amended herein. Support for the amendments to independent claims 1, 17 and 23 may be found, for example, in the specification, beginning on page 13, line 8, and in FIG. 4.

No new matter is being introduced by these amendments. Further, these amendments are not being made for the purpose of patentability, but merely to clarify the subject matter to which Applicants are entitled.

New claim 29 is being added herein. Support for new claim 29 may be found, for example, in the specification, beginning on page 13, line 18. No new matter is being introduced by the addition of new claim 29.

In the outstanding Office Action, the Examiner finally rejected claims 1-3, 17-19 and 23-25 under 35 U.S.C. §101 as allegedly lacking patentable utility. The Examiner also finally rejected claims 1-3, 17-19 and 23-25 under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with enablement requirement on the basis that one of ordinary skill in the art would not know how to use the claimed invention. The Examiner finally rejected claims 1-3, 17-19 and 23-25 under 35 U.S.C. §112, first paragraph, as also allegedly failing to comply with the enablement requirement on the basis that undue experimentation is required. The Examiner also finally rejected claims 1-3, 17-19 and 23-25 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention.

The present invention has been described in Applicants' prior response, incorporated by reference herein.

FORMAL REJECTIONS

As mentioned above, the Examiner finally rejected claims 1-3, 17-19 and 23-25 under 35 U.S.C. §101 as allegedly lacking patentable utility. Specifically, in the final Office Action, the Examiner, on page 2, 5th paragraph of the Office Action, stated that,

> the claimed method is merely directed to transforming data that represent gene expression signals. The specification, however, does not teach any utility for a method that simply transforms expression signal data by itself. Use of the claimed method to analyze the expression signals such that patterns are identified is certainly of scientific interest; however, no specific, substantial, and credible utility is set forth for the mere transformation of data.

Applicants respectfully disagree with the Examiner's assertions. However, Applicants have made clarifying amendments to independent claims 1, 17 and 23, and thus respectfully request reconsideration and withdrawal of the rejections.

Notwithstanding the amendments, Applicants submit the following remarks. Independent claims 1, 17 and 23, from which all pending claims depend, each recite, in part, deriving a transformation that transforms a plurality of gene expression signals into transformed gene expression signals for a gene resulting in a uniform distribution of the transformed gene expression signals. The uniform distribution of transformed gene expression signals may be used to determine gene expression patterns.

M.P.E.P. §2107 II. (A)(3) states that,

> [a]n invention has a well-established utility if (i) a person of ordinary skill in the art would immediately appreciate why the invention is useful based on the characteristics of the invention (e.g., properties or applications of a product or process), and (ii) the utility is specific, substantial, and credible.

M.P.E.P. §2107 II. (B) (1) states that,

> [i]f the applicant has asserted that the claimed invention is useful for <u>any particular practical purpose</u> (i.e., it has a 'specific and substantial utility') and the assertion would be considered credible by a person of ordinary skill in the art, [a rejection based on lack of utility] should not be imposed]. (emphasis added)

Thus, for at least the reason that independent claims 1, 17 and 23 each recite using the uniform distribution of transformed gene expression signals to determine gene expression patterns, clearly a 'particular practical purpose,' all of the present claims comport with the utility requirements of 35 U.S.C. §101. However, Applicants further point out that, by way of example only, in the specification, beginning on page 6, line 27, it is stated that,

> [n]ew expression data from samples that have an unknown genetic makeup are compared with the gene expression patterns. Based on this comparison, the new samples are classified as belonging to one of the two phenotypes.

Further, by way of example only, in the specification, beginning on page 18, line 23, it is described that statistically significant patterns found in the phenotype set can be used to build a discriminant function. The discriminant function can then be used to determine whether or not a sample belongs to the phenotype or control set.

Therefore, the Examiner's assertions that the specification does not teach any utility for the claimed invention have no merit.

Thus, Applicants respectfully submit that independent claims 1, 17 and 23, as well as all claims dependent thereon, clearly possess patentable utility, and as such, Applicants request reconsideration and withdrawal of the rejection of claims 1-3, 17-19 and 23-25 under 35 U.S.C. §101.

As highlighted above, the Examiner also finally rejected claims 1-3, 17-19 and 23-25 under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the enablement requirement on the basis that one of ordinary skill in the art would not know how to use the claimed invention. Namely, the Examiner stated, on page 3, 2nd paragraph of the Office Action, that "since the claimed invention is not supported by either an asserted utility or a well established utility . . . . one of ordinary skill in the art clearly would not know how to use the claimed invention."

Applicants respectfully disagree with the Examiner's rejection. However, as stated above, Applicants have made clarifying amendments to independent claims 1, 17 and 23, and thus respectfully request reconsideration and withdrawal of the rejections.

Notwithstanding the amendments, Applicants submit the following remarks. First, for at least the reasons stated above, claims 1-3, 17-19 and 23-25 all comport with the utility requirements of 35 U.S.C. §101. Further, Applicants respectfully assert that given the detailed teachings of the claims and supporting specification, one possessing ordinary skill in the art would know how to use the claimed invention.

Applicants direct the Examiner's attention to the specification, beginning on page 7, line 18 and beginning on page 13, line 3, wherein clear and detailed support is provided for deriving a transformation and using that transformation to transform a plurality of gene expression signals into transformed gene expression signals resulting in a uniform distribution of the transformed gene expression signals. By way of example only, the specification, beginning on page 13, line 13, describes deriving the transformation, e.g., transformation f_g, (equation (1)). The specification further describes, beginning on page 14, line 24, that each transformation determined corresponds to one gene and is used to convert the expression levels of entries (e.g., of the phenotype matrix) that correspond to the gene to a transformed value.

It is therefore Applicants' position that the instant teachings set forth, in extensive detail, the techniques of the present invention in a way that one of ordinary skill in the art would know how to make and use the invention. Applicants respectfully thus submit that claims 1-3, 17-19 and 23-25 comport with the requirements of 35 U.S.C. §112, first paragraph, and thus respectfully request reconsideration and withdrawal of the rejection.

As highlighted above, the Examiner also finally rejected claims 1-3, 17-19 and 23-25 under 35 U.S.C. §112, first paragraph, as also allegedly failing to comply with the enablement requirement on the basis that undue experimentation is required. Applicants respectfully disagree with the Examiner's assertions. However, as noted above, Applicants have made clarifying amendments to independent claims 1, 17 and 23, and thus respectfully request reconsideration and withdrawal of the rejections.

Notwithstanding the amendments, Applicants submit the following remarks. The Examiner presented eight factors to be considered in making a determination regarding undue experimentation. The first factor, as highlighted by the Examiner, is the quantity of experimentation necessary. The Examiner alleged, e.g., on page 4, 1st paragraph, of the Office

Action, that "[i]n order to practice the claimed invention one of ordinary skill in the art must be able to transform data that transforms gene expression signals [which] constitutes undue experimentation."

As highlighted above, a transformation, e.g., transformation f_g (equation (1)), shown on page 13, line 16, of the specification, can be used to convert entries in a phenotype matrix. It is Applicants' position that one of ordinary skill in the art would be able to, without undue experimentation, use a transformation, such as equation 1, to transform gene expression signals. As such, the quantity of experimentation necessary to practice the present invention is at most minimal.

The second and third factors, as highlighted by the Examiner, are the amount of direction or guidance presented and the presence or absence of working examples. Regarding these factors, the Examiner stated in the Office Action, page 4, 3rd paragraph, that,

> [t]he specification does not teach how to derive a transformation that transforms gene expression signals. Instead . . . the specification teaches applying a transformation to convert a probability distribution of gene expression signals in control samples to a uniform distribution.

Respectfully, Applicants disagree with the Examiner's assertion. The specification clearly teaches how to derive a transformation and use that transformation to transform gene expression signals into transformed gene expression signals for a gene. Again Applicants reference the specification, beginning on page 7, line 18 and beginning on page 13, line 3, and respectfully submit that given these teachings, one of ordinary skill in the art should understand how to derive a transformation and how to use that transformation to transform gene expression signals.

The fourth factor, as highlighted by the Examiner, is the nature of the invention. With regard to the fourth factor, the Examiner stated in the Office Action, page 5, 2nd paragraph, that "[t]he claims are drawn to a method for transforming gene expression signals by somehow deriving a transformation that transforms the plurality of gene expression signals into a uniform distribution which is then used to determine gene expression signals." As above, independent claims 1, 17 and 23 are amended herein. Additionally, Applicants again reference the

specification beginning on page 7, line 18 and beginning on page 13, line 3, which clearly explains, in detail, how to derive a transformation and how to use that transformation to transform gene expression signals.

The fifth and seventh factors (taken out of order by the Examiner), as highlighted by the Examiner, are the state of the prior art and the predictability of the art, respectively. Applicants note, that with regard to these factors, the Examiner has acknowledged, in the Office Action, page 5, 3rd paragraph, that "[t]the prior art does not teach transforming gene expression signals and using a uniform distribution for the determination of gene expression signals."

The sixth factor, as highlighted by the Examiner, is the relative skill of those in the prior art. Again, Applicants note that with regard to these factors, the Examiner has acknowledged, in the Office Action, page 5, 4th paragraph, that "[t]he skill of those in the art of bioinformatics is high."

The eighth factor, as highlighted by the Examiner, is the breadth of the claims. With regard to the eighth factor, the Examiner, in the Office Action, page 5, 5th paragraph, stated that,

> [t]he claims are not commensurate in scope with the specification for the reasons stated above. The skilled practitioner would first turn to the instant specification for guidance to practice methods. However, the instant specification does not provide specific guidance to practice these embodiments.

As Applicants have presented above, the specification provides a clear, detailed and sufficient description that would enable one of ordinary skill in the art to practice the invention.

It is thus Applicants' position that the present teachings fully comply with the enablement requirements of 35 U.S.C. §112, first paragraph. As such, Applicants respectfully request reconsideration and withdrawal of the rejections.

As highlighted above, the Examiner also finally rejected claims 1-3, 17-19 and 23-25 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. Applicants traverse the Examiner's rejection. However, Applicants have made clarifying amendments to

independent claims 1, 17 and 23, and thus respectfully request reconsideration and withdrawal of the rejections.

Notwithstanding the amendments, Applicants submit the following remarks. Applicants first point out that in the Office Action dated September 16, 2004, the rejection of the same claims under 35 U.S.C. §112, second paragraph, was withdrawn, and many of the limitations now at issue are the same as those that appeared in the claims from which the rejection was withdrawn.

The Examiner, in the Office Action, page 6, 2nd paragraph, stated that,

> [regarding the] step of 'deriving a transformation that transforms, within a selected interval' . . . it is unclear what interval is intended for selection. Is the interval one of time, space, gene location, level of expression or some other interval?

As mentioned above, independent claims 1, 17 and 23 have been amended. However, Applicants further direct the Examiner's attention to the specification beginning on page 22, line 23 and to FIGS. 5 and 6. From these teachings it is clear that the interval described, e.g., in independent claims 1, 17 and 23, relates to an interval of gene expression signals.

The Examiner, in the Office Action, page 6, 3rd paragraph, further stated that,

> [regarding the limitation of] 'deriving a transformation that transforms'. . . it is unclear what transformation is taking place. What is being transformed; signal intensity, width of the peak, area under a curve or some other parameter?

With regard to deriving a transformation, Applicants direct the Examiner's attention to the specification, beginning on page 13, line 3 and to FIGS. 3 and 4. For example, see page 13, lines 14-15, wherein "a new variable v [is] obtained by transforming the original variable u," and on page 17, line 16, wherein a transformation f_g is shown. With regard to the transformation transforming data, Applicants again reference the specification beginning on page 22, line 23 and FIGS. 5 and 6, wherein gene expression signals of a phenotype matrix are being transformed.

The Examiner, in the Office Action, page 6, 4th paragraph, also stated that,

> [regarding the limitation of] 'deriving a transformation that transforms [. . .] gene expression signals into a uniform distribution of transformed gene expression [. . .] each gene expression signal is converted by the transformation into a transformed gene expression signal in the uniform distribution[,]' it is unclear what is intended by this step of the claims, as it is a circular step and thus confusing.

Applicants again point out that independent claims 1, 17 and 23 are amended herein. However, respectfully, Applicants fail to see how the present claim language can be construed as being 'circular.' Namely, independent claims 1, 17 and 23 recite, in part, deriving a transformation that transforms a plurality of gene expression signals into transformed gene expression signals resulting in a uniform distribution of the transformed gene expression signals, where each gene expression signal (e.g., of the plurality of gene expression signals) is converted by the transformation into a transformed gene expression signal in the selected interval. Specifically, a transformation is derived. The transformation can be used to transform gene expression signals into transformed gene expression signals. Applicants find the above language to be clear and unambiguous and cannot ascertain the 'circular' nature the Examiner makes reference to.

As such, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. §112, second paragraph.

In view of the foregoing, Applicants submit that all of the pending claims, i.e., claims 1-3, 17-19, 23-25 and 29, are in condition for allowance and such favorable action is earnestly solicited.

If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below.

The Examiner's attention to this matter is appreciated.

Respectfully submitted,

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